

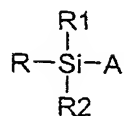
CLAIMS:

1. A pigment composition comprising particles (p) based on aluminum metal, said particles (p) having
5 a surface oxidation layer with a mean thickness at most equal to 5 nm and said particles (p) being covered with a protective layer comprising hydrocarbon chains R bonded to the surface of the particles (p) via [particle]-Al-O-Si-R bonds.
10
2. The composition as claimed in claim 1, characterized in that the particles (p) are anisotropic particles with mean dimensions of less than or equal to 500 microns.
15
3. The composition as claimed in claim 2, characterized in that the particles (p) are particles of flake type with a mean transverse diameter of less than or equal to 500 microns and
20 with a mean thickness of less than or equal to 3 microns.
4. The composition as claimed in claim 3, characterized in that the aspect ratio of the
25 particles (p) (ratio of the mean thickness to the mean transverse diameter) is between 1/5 and 1/1000.
5. The composition as claimed in any one of claims 1
30 to 3, characterized in that the specific surface of the particles (p) is between 0.5 and 500 m²/g.
6. The composition as claimed in any one of claims 1
35 to 4, characterized in that the hydrocarbon chains R are chosen from:
 - alkyl chains comprising from 1 to 30 carbon atoms;
 - alkyl chains which are completely or partially fluorinated and optionally hydroxylated

- comprising from 1 to 30 carbon atoms;
- alkenyl or alkynyl chains comprising from 1 to 30 carbon atoms;
 - cyclic, aromatic, optionally halogenated, hydrocarbon chains comprising between 6 and 30 carbon atoms;
 - hydrocarbon chains comprising from 1 to 30 carbon atoms which are substituted by at least one amine functional group;
 - hydrocarbon chains comprising from 3 to 30 carbon atoms and comprising polymerizable groups.
7. The composition as claimed in any one of claims 1 to 6, characterized in that the mean amount of hydrocarbon chains R bonded to the surface of the particles (p) is greater than or equal to 10 micromol per m².
8. The composition as claimed in any one of claims 1 to 7, characterized in that it is provided in the form of a powder comprising the particles (p) in the dry state or else of a dispersion comprising the particles (p) in an aqueous medium or else of a dispersion comprising the particles (p) in a solvent medium.
9. The composition as claimed in any one of claims 1 to 8, characterized in that it is devoid of the presence of any fatty acid or fatty acid salt.
10. A process for the preparation of a composition as claimed in one of claims 1 to 9, characterized in that it comprises a stage (E) which consists in deforming, under mechanical stress, particles (p₀) based on aluminum metal in the presence of the following compounds:

(i) silanes corresponding to the following

formula (I):

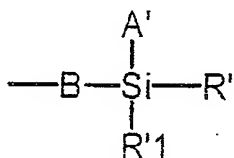


Formula (I)

wherein:

- 5 - R represents a hydrocarbon chain as defined in claim 1 or claim 6;
- A denotes a hydrolyzable group; and
- R1 and R2, which are identical or different, each represent:
- 10 - a hydrolyzable group which is or is not identical to the group A;
- a hydrocarbon chain which is or is not identical to the chain R; or
- a group of formula (II):

15



(Formula II)

wherein:

- B is a hydrocarbon chain optionally interrupted by oxygen atoms;
- 20 - A' has one of the meanings given above for A;
- R' has one of the meanings given above for R;
- R'1 denotes a hydrolyzable group or a hydrocarbon chain;

25

(ii) water, at least in the form of traces; and optionally

(iii) an organic solvent.

30

11. The process as claimed in claim 10, characterized

in that stage (E) is implemented by carrying out a deformation under mechanical stress of the particles (p_0) in a mill in the presence of the compounds (i), (ii) and optionally (iii).

5

12. The process as claimed in claim 10 or as claimed in claim 11, characterized in that the particles (p_0) employed in stage (E) exhibit an initial particle size of between 0.1 and 100 microns.

10

13. The process as claimed in any one of claims 10 to 12, characterized in that the particles (p_0) which are employed in stage (E) are particles which have been grafted beforehand with organic chains.

15

14. The process as claimed in any one of claims 10 to 13, characterized in that, in the silanes of formula (I) used, the hydrolyzable groups are chosen from chloro, alkyloxy and aryloxy groups.

20

15. The process as claimed in any one of claims 10 to 14, characterized in that the amount of silanes (I) employed in stage (E) is greater than or equal to 40 g per kg of aluminum.

25

16. The process as claimed in any one of claims 10 to 15, characterized in that the solvent (iii) employed in stage (E) is chosen from mixtures of aliphatic hydrocarbons and/or mixtures of aromatic hydrocarbons.

30

17. The process as claimed in any one of claims 10 to 16, characterized in that the amount of organic solvent (iii) employed in stage (E) is between 1 and 10 kg per kg of aluminum.

35

18. The process as claimed in any one of claims 11 to 17, characterized in that stage (E) is carried out at a temperature of between 10 and 80°C.

19. The process as claimed in any one of claims 11 to 18, characterized in that the process comprises, following stage (E), a maturing stage which consists in leaving the medium standing for at least 24 hours at a temperature of greater than or equal to 20°C.
20. The process as claimed in any one of claims 11 to 19, characterized in that the process comprises, following stage (E) and the optional maturing stage, a stage of removal of the solvent, whereby a composition in the form of a powder is obtained, which composition can subsequently be optionally dispersed in a solvent phase, whereby a composition in the form of a dispersion is obtained.
21. A process for the preparation of a composition as claimed in one of claims 1 to 9, characterized in that it comprises the stage (E') which consists in deforming, under mechanical stress, particles (p'₀) based on aluminum metal under an inert gas atmosphere in the presence of the following compounds:
- (i') silanes corresponding to the general formula (I) as defined in claim 10; and
- (ii') water, at least in the form of traces.
22. The use of a composition as claimed in any one of claims 1 to 9 or of a composition obtained by a process as claimed in any one of claims 10 to 21 for the formulation of a metallic paint, of a printing ink with a metallic appearance or of a plastic with a metallic appearance.

23. A metallic paint composition comprising a composition as claimed in any one of claims 1 to 9 or a composition obtained by a process as claimed in any one of claims 10 to 21.